

CHAPTER IX: ROLE OF GLYCANS IN TROPISM

Now, an area that's really begin to impact the glycosaminoglycan field, for that matter, fairly even beyond the glycosaminoglycan field with regard to the broad glycomics area is the fact that several pathogens, protazoans, viruses, whether you're looking at HIV or influenza virus, or Ebola virus, or bacterial infections, as simple as the staph infections or the more complex helicobacterial infections, they all use the diversity of these glycans or carbohydrates that are expressed on these cells, as way to achieve tropism.

In many sense, if you look at these pathogens, they diffuse outside the cell surface, sort of scan the cell surface for unique epitopes, and these epitopes are then leveraged by these pathogens to achieve cell tropism or tissue tropism in, sort of, from an evolutionary point of view, the thought is the following, that one of the things that cells do is dramatically change the way they synthesize these polysaccharides as a way to evade infectious agents. And, the question is, infectious agents have always figured out a way to adapt to these kinds of structures, and it's a constant battle, in terms of these kinds of evolutionary pressures, in terms of how these pathogens access various cell types.

So, this is an area of active investigation that's emerging, and, particularly, an area that the consortia for functional glycomics if focusing on is the influenza virus, how the epithelial cells have unique carbohydrate structures that are different in humans to that of the birds. And, the question is, as an example, for the current H5 N1, which is a pandemic virus in birds, how would the mutations on that virus eventually lead to the appropriate tropism in the upper epithelial cells and the key set of residues on the virus that needs to mutate are those that would have to correspondingly change the residue

complimentarity to the glycans that are there on the epithelial cell surface. So, this is obviously a very important and exciting and emerging area, with regard to the role of glycans and how glycans regulate fundamental processes.